

## CORONARY HEART DISEASE: EXECUTIVE SUMMARY

Based primarily on statistical reports, claims are often made that cigarette smoking is a major cause of coronary heart disease (CHD), which occurs when the heart does not receive enough oxygen. Despite such allegations, however, a careful review of the literature on CHD demonstrates that the causes of CHD are still not well understood. This literature also demonstrates that there is much that is unknown about what role, if any, smoking may play in its development. In fact, when the literature on tobacco and CHD is critically reviewed, a number of perplexing and unresolved paradoxes surface. For example, smoking is only one of many statistical associations, termed "risk factors," that have been reported for heart disease. Moreover, reductions in such risk factors have not been demonstrated to lead to corresponding reductions in heart disease mortality rates. In addition, there are a variety of inconsistencies and anomalies in the statistical studies of smoking and CHD. Finally, scientists have not been able to establish what, if anything, in cigarette smoke is related to the development of CHD. Accordingly, it is readily apparent that cigarette smoking has not been proven to cause CHD.

The claim that smoking is a risk factor for CHD refers to reports that smokers have a statistically increased risk of the disease. However, it is important not to confuse risk factors with causal factors because, among other reasons, statistical associations cannot provide information on biological processes

2061690853

whereby a factor, such as smoking, might lead to heart disease. Thus, such associations, by themselves, cannot establish a causal relationship.

Furthermore, smoking is only one of hundreds of other factors that have been reported to be statistically related to CHD. A few of the most well-known of these include gender (males are more likely to develop CHD than females), genetics, elevated blood levels of cholesterol, high blood pressure, diet, obesity, physical inactivity and stress. Additional risk factors continue to appear in the literature. Yet, which, if any, of these may have causal significance is not known. Certainly, however, there is reason to question their significance in view of the failure of so-called intervention trials to demonstrate that reductions in levels of risk factors, including smoking, lead to reductions in CHD mortality risk.

There are also notable inconsistencies and anomalies in many of the studies reporting associations of smoking and CHD, again, calling into question the claim that smoking causes CHD. For example, some studies, particularly those of women, do not even report a statistical relationship between smoking and CHD. Others indicate that any statistical relationship between smoking and heart disease may be observable only in groups with a high fat or cholesterol intake. It is also a statistical paradox that trends in CHD rates over time are sometimes reported to be inconsistent

with trends in cigarette smoking. In recent decades, for example, trends in CHD rates have been reported to be increasing in some countries and decreasing in others, apparently with little or no relationship to changes in smoking.

Claims that smoking causes CHD often rely strongly on still other reports that quitting smoking reduces the risk for this disease. It is important to recognize that comparisons of the CHD rates of smokers and exsmokers would be valid only if it were assumed that these groups were the same in all respects except for their smoking habits. This assumption is false, however, as demonstrated by studies from a variety of countries, including Britain, the United States, Japan, and Finland, which report that exsmokers differ from smokers in fundamental, even possibly genetic, ways. In fact, these studies suggest that exsmokers tend to be more like nonsmokers even before they quit smoking.

Finally, the claim is sometimes made that certain constituents in cigarette smoke, specifically carbon monoxide (CO) and nicotine, have adverse effects on the cardiovascular system. Various theories have been discussed about how these substances could exert an effect. However, despite the intensive research to which tobacco smoke has been subjected over many years, these constituents, as found in cigarette smoke, have not been scientifically proven to cause CHD.

In conclusion, many questions and paradoxes remain unanswered about the possible nature of the role, if any, that smoking may have in the development of CHD. These paradoxes reflect a challenge that only continued research can resolve. Perhaps what is most apparent from the literature is that the causes of heart disease are likely to be numerous and complicated, and that claims focusing on a single factor, such as smoking, should be regarded with considerable skepticism.